Montana Department of Transportation
Billings District Office
PO Box 20437
Billings, MT 59104–0437

Memorandum

To: Matt Strizich, P.E.
Materials Bureau Engineer

From: William Henning
District Materials Supervisor

Date: May 15, 2007

Subject: HSIP 1066(51) PE CN 6089
SF069 – Parkhill/13th Street - Billings
Soil Survey

Attached please find soil survey information on the subject project. Attached is a General Statement, location map, Form 111, and corrosivity results. If you have any questions, please contact the Billings District Lab.

Attachments

WJH

copies: Preconstruction Bureau
Hydrology
Surfacing Design Unit
Engineering File
District Lab

GENERAL STATEMENT

This project is located in Yellowstone County in the city of Billings at the intersection of Parkhill and North 13th Street West. Both of these roadways are functionally classified as Urban Collectors.

The realignment requires the reconstruction of approximately 200 ft. of Parkhill each side of the intersection. The work on 13th Street West will be kept to a minimum and designed to tie into the realigned legs of Parkhill.

No as-builts have been located for the intersection of Parkhill and North 13th Street West. The existing surfacing is plant mix.

The measurements shown on the Form 111's are as accurate as possible. Distances and milepost designations are approximate and may be + or – of the stated site. All references to centerline are to PTW centerline. Distances Rt. of CL are driving lanes and Lt. of CL are passing lanes.

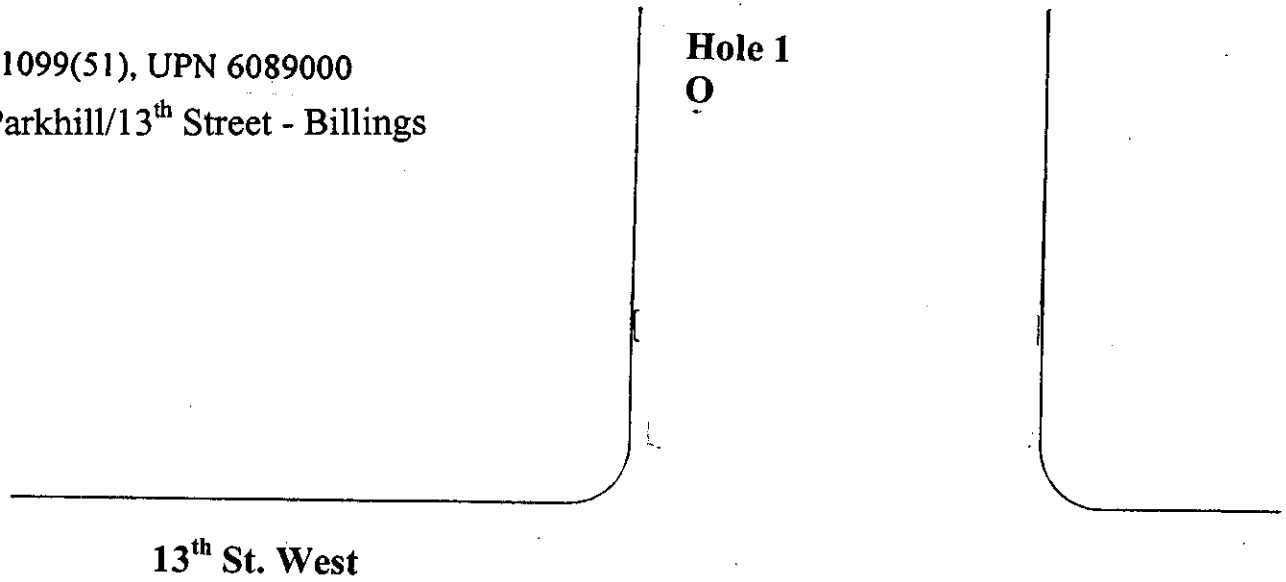
Two(2) borings were made, with depths and material types recorded on the on the Form 111.

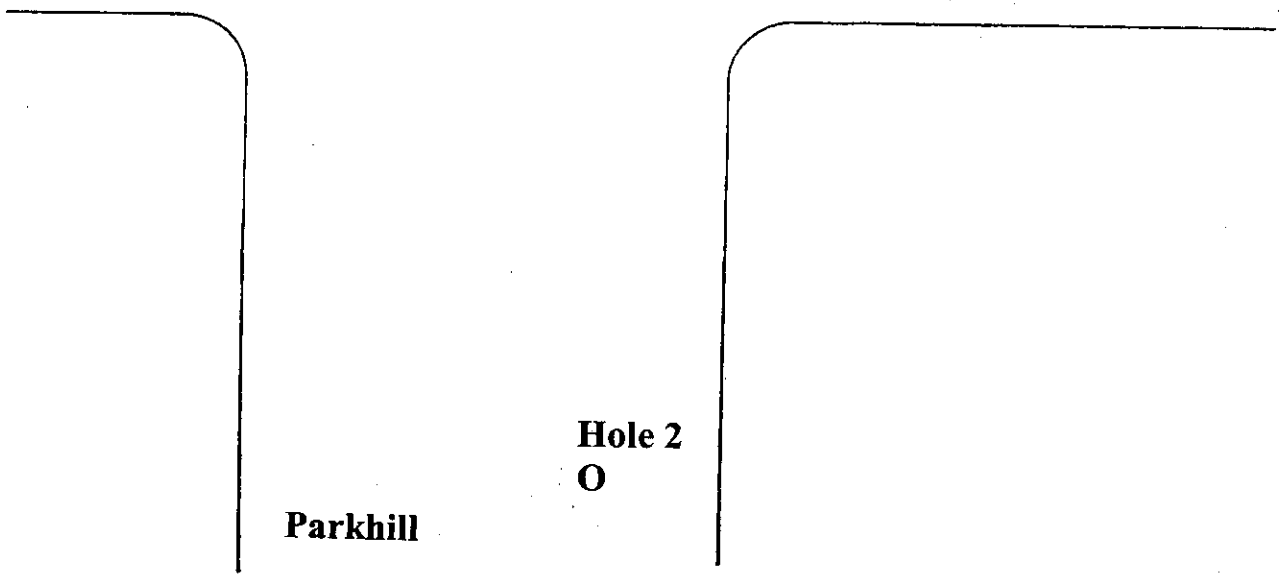
The recorded depths of the asphalt surfacing range from 0.50 feet to 0.65 feet. Base gravel is very thin, from .25 to .30 feet thick. In-place moisture and Moisture-Density relations were performed on the subgrade samples. Generally, the subsoils are A-4 to A-6 soils extending to depths of 4.2 to 5.0 feet, where dense gravel was encountered and extended to the depths drilled.The A-6 subsoils were given an R value of -5. Subgrade moisture contents were well above optimum moisture and are noted on the From 111's.

A pipe survey was not performed. The chemical and corrosion test results are attached.

HSIP 1099(51), UPN 6089000

SF069 – Parkhill/13th Street - Billings





Form No. 111/Q:MT-STD\F111.doc
ised 4/11/2006

Montana Department of Transportation
Preconstruction Soil Survey Data
and Special Recommendations Relative to Subgrade and Road Surface Design

oject Number HISP 1099(51) Project Name SF109 - Parkhill/13th Street - Billings Length 475'+/- County Yellowstone Date 5/15/2007

N 6089

pmitted by S. Helms Title MLS W. Henning District Materials Supervisor G. Neville Dist. Eng. Svcs. Supervisor

	Sample Number	Date	Reference to Centerline – Location of Boring	Depth	Representing Stationing	Soil Class (MT214)	LL	PI	10 Mesh (2.00 mm)	40 Mesh (.425 mm)	200 Mesh (.075 mm)	In Place Density	Specific Gravity	Density (LBS/FT#) Maximum Dry	Moisture Percent Natural	Moisture Percent Optimum	Water Table Depth to	(AASHTO T190) "R" Value
		3/13/2007	14.6' RT CL	0 – 0.5'	125' W of Intersection	Asphalt												
				0.5 – 0.8'	of Parkhill and 13th St.	Base Gravel												
				0.8 – 3.4'	on Parkhill	A-4(2)	24	9	97	95	50.8		2.59	115	16.3	6	N/A	
				3.4 – 4.2'		A-6(6)	33	19	96	92	51.7		2.58		15.0		N/A	-5
				4.2 – 6.0'		A-1-a(0)	NP	NP	39	29	13.7		2.58		5.7		N/A	
		3/13/2007	8.0' LT CL	0 – 0.65'	100' E of Intesection	Asphalt												
				0.65 – 0.8'	of Parkhill and 13th St.	Base Gravel												
				0.8 – 2.6'	on Parkhill	A-6(5)	34	16	94	91	51.3		2.55	117	16.8	17	N/A	-5
				2.6 – 5.0'		A-6(8)	32	18	97	95	61.3		2.58		15.6		N/A	-5
				5.0 – 7.3'		A-1-a(0)	21	4	33	27	14.1		2.67	139	5.0	6	N/A	

marks:

stribution: Preconstruction Bureau; Geotech, Materials Bureau; Surfacing Design, Materials Bureau; District Lab; Area Lab, _____, _____
NDT Data Collection

Montana Department of Transportation
PO Box 201001
Helena, MT 59620-1001

MASTER FILE COPY

Memorandum

To: William Henning, District Materials Supervisor
From: Scott Barnes, P.E., Testing Supervisor
Douglas G. McBroom M.S., Chief Chemist

Date: April 16, 2007

Project: HSIP1099(51) SF069-Parkhill/13th Street-Billings

UPN 6089

Subject: **Corrosivity Results and Pipe Recommendations**
Lab No 877402-877407

Attached are the corrosive characteristics and test results for the soil samples, which you submitted. None of the soil samples sent have corrosive characteristics toward Zinc and Steel, and Aluminum, and concrete.

Table 1 summarizes the specific results of the test samples for soils and water. This table cannot be modified by anyone other than Materials lab employees.

Table 2 is interactive for the user. It utilizes the fixed results reported in Table 1 and allows the user to manipulate end data by inputting different pipe gage factors.

Tables 1 and 2 for this project are located at:

\\astro\hydr\Corrosivity_Tests\ CM HSIP1099(51) SF069-Parkhill/13th Street-Billings

Table 1 - Soils

Project Number HSIP 1099(51)

Project Name SF069-Parkhill/13th Street-Billings

UPN **6089.0**

Corrosive Properties of Soil Samples									
	Sample No.	PH	Marble PH	Sulfate, % SO_4	Conductivity, m MHOS	Resistivity, OHMS	Corrosive to Zinc & Steel	Corrosive to Aluminum	Alkali Reactive to Concrete
877402	1	7.1	7.2	>0.01	0.12	8333			
877403	2	7.74	7.64	>0.01	0.10	10000			
877404	3	8.13	7.91	>0.01	0.08	12500			
877405	4	7.53	7.34	>0.01	0.23	4348			
877406	5	7.83	7.71	>0.01	0.20	5000			
877407	6	8.1	7.89	>0.01	0.16	6250			
	Max	8.130	7.910	0.00%	0.23	12500	0	0	0
	Min	7.100	7.200	0.00%	0.08	4348	0%	0%	0%
	Average	7.738	7.615		0.15	7739			
	Std Deviation	0.386	0.290		0.06	3142			

Total Number of Samples Tested	**6**
Number of Corrosive or Alkali Reactive Samples (00.0%)	**0**
Corrosive to Zinc coated Steel Only	0
Corrosive to Aluminum and Zinc coated Steel Only	0
Corrosive to Aluminum, Zinc coated Steel, and Alkali Reactive to Concrete	0
Corrosive to Zinc coated Steel, and Alkali Reactive to Concrete Only	0
Alkali Reactive to Concrete Only	0